

SEQUENCE LISTING

<110> Croce, Carlo
Brenner, Charles
Pekarski, Yuri

<120> CRYSTAL STRUCTURE OF WORM NitFhit
REVEALS THAT A Nit TETRAMER BINDS TWO Fhit DIMERS

<130> CRO01.NP007

<150> 60/204,713

<151> 2000-05-16

<160> 11

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 276

<212> PRT

<213> Homo sapien

<400> 1

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Thr	Gln	Gly	Ala	Lys	Ile	Val	Ser	Leu	Pro	Glu	Cys	Phe	Asn	Ser	Pro
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Tyr	Gly	Ala	Lys	Tyr	Phe	Pro	Glu	Tyr	Ala	Glu	Lys	Ile	Pro	Gly	Glu
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Ser	Thr	Gln	Lys	Leu	Ser	Glu	Val	Ala	Lys	Glu	Cys	Ser	Ile	Tyr	Leu
65				70						75				80	
Ile	Gly	Gly	Ser	Ile	Pro	Glu	Glu	Asp	Ala	Gly	Lys	Leu	Tyr	Asn	Thr
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Cys	Ala	Val	Phe	Gly	Pro	Asp	Gly	Thr	Leu	Leu	Ala	Lys	Tyr	Arg	Lys
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Ile	His	Leu	Phe	Asp	Ile	Asp	Val	Pro	Gly	Lys	Ile	Thr	Phe	Gln	Glu
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Ser	Lys	Thr	Leu	Ser	Pro	Gly	Asp	Ser	Phe	Ser	Thr	Phe	Asp	Thr	Pro
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Tyr	Cys	Arg	Val	Gly	Leu	Gly	Ile	Cys	Tyr	Asp	Met	Arg	Phe	Ala	Glu
145				150				155					160		
Leu	Ala	Gln	Ile	Tyr	Ala	Gln	Arg	Gly	Cys	Gln	Leu	Leu	Val	Tyr	Pro
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Gly	Ala	Phe	Asn	Leu	Thr	Thr	Gly	Pro	Ala	His	Trp	Glu	Leu	Leu	Gln
			180					185					190		
Arg	Ser	Arg	Ala	Val	Asp	Asn	Gln	Val	Tyr	Val	Ala	Thr	Ala	Ser	Pro
	195					200					205				
Ala	Arg	Asp	Asp	Lys	Ala	Ser	Tyr	Val	Ala	Trp	Gly	His	Ser	Thr	Val

210 215 220
 Val Asn Pro Trp Gly Glu Val Leu Ala Lys Ala Gly Thr Glu Glu Ala
 225 230 235
 Ile Val Tyr Ser Asp Ile Asp Leu Lys Lys Leu Ala Glu Ile Arg Glu
 245 250 255
 Gln Ile Pro Val Phe Arg Gln Lys Arg Ser Asp Leu Tyr Ala Val Glu
 260 265 270
 Met Lys Lys Pro
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<210> 2
 <211> 276
 <212> PRT
 <213> mouse

<400> 2
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 Lys Ser Asp Asn Leu Thr Arg Ala Cys Ser Leu Val Arg Glu Ala Ala
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 Lys Gln Gly Ala Asn Ile Val Ser Leu Pro Glu Cys Phe Asn Ser Pro
 35 40 45
 Tyr Gly Thr Thr Tyr Phe Pro Asp Tyr Ala Glu Lys Ile Pro Gly Glu
 50 55 60
 Ser Thr Gln Lys Leu Ser Glu Val Ala Lys Glu Ser Ser Ile Tyr Leu
 65 70 75 80
 Ile Gly Gly Ser Ile Pro Glu Glu Asp Ala Gly Lys Leu Tyr Asn Thr
 85 90 95
 Cys Ser Val Phe Gly Pro Asp Gly Ser Leu Leu Val Lys His Arg Lys
 100 105 110
 Ile His Leu Phe Asp Ile Asp Val Pro Gly Lys Ile Thr Phe Gln Glu
 115 120 125
 Ser Lys Thr Leu Ser Pro Gly Asp Ser Phe Ser Thr Phe Asp Thr Pro
 130 135 140
 Tyr Cys Lys Val Gly Leu Gly Ile Cys Tyr Asp Met Arg Phe Ala Glu
 145 150 155 160
 Leu Ala Gln Ile Tyr Ala Gln Arg Gly Cys Gln Leu Leu Val Tyr Pro
 165 170 175
 Gly Ala Phe Asn Leu Thr Thr Gly Pro Ala His Trp Glu Leu Leu Gln
 180 185 190
 Arg Ala Arg Ala Val Asp Asn Gln Val Tyr Val Ala Thr Ala Ser Pro
 195 200 205
 Ala Arg Asp Asp Lys Ala Ser Tyr Val Ala Trp Gly His Ser Thr Val
 210 215 220
 Val Asp Pro Trp Gly Gln Val Leu Thr Lys Ala Gly Thr Glu Glu Thr
 225 230 235 240
 Ile Leu Tyr Ser Asp Ile Asp Leu Lys Lys Leu Ala Glu Ile Arg Gln
 245 250 255
 Gln Ile Pro Ile Leu Lys Gln Lys Arg Ala Asp Leu Tyr Thr Val Glu
 260 265 270
 Ser Lys Lys Pro
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<210> 3
 <211> 288

<212> PRT
<213> X. laevis

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Glu Ala Ala Gly Arg Arg Ala Cys Met Val Phe Leu Pro Glu Ala Phe
35      40      45
Asp Tyr Ile Gly Gly Ser Ile Glu Glu Thr Leu Ser Leu Ala Glu Ser
50      55      60
Leu His Gly Asp Thr Ile Gln Arg Tyr Thr Gln Leu Ala Arg Glu Cys
65      70      75
Gly Leu Trp Leu Ser Leu Gly Gly Phe His Glu Lys Gly Pro Asn Trp
85      90      95
Asp Thr Asp Gln Arg Ile Ser Asn Ser His Val Val Val Asp Asn Thr
100     105     110
Gly His Ile Val Ser Val Tyr Arg Lys Ala His Leu Phe Asp Val Asp
115     120     125
Leu Gln Asn Gly Val Ser Leu Arg Glu Ser Ser Thr Leu Pro Gly
130     135     140
Ala Glu Leu Ile Arg Pro Ile Thr Ser Pro Ala Gly Lys Ile Gly Leu
145     150     155
Gly Val Cys Tyr Asp Leu Arg Phe Pro Glu Phe Ser Leu Ala Leu Ala
165     170     175
Gln Gln Gly Ala Glu Leu Leu Thr Tyr Pro Ser Ala Phe Thr Leu Thr
180     185     190
Thr Gly Leu Ala His Trp Glu Val Leu Leu Arg Ala Arg Ala Ile Glu
195     200     205
Thr Gln Cys Tyr Val Val Ala Ala Ala Gln Thr Asp Arg His Asn Glu
210     215     220
Lys Arg Thr Ser Tyr Gly His Ala Met Val Val Asp Pro Trp Gly Leu
225     230     235
Val Ile Gly Gln Cys Gln Glu Gly Thr Gly Ile Cys Tyr Ala Glu Ile
245     250     255
Asp Ile Pro Tyr Met Glu Arg Val Arg Asp Met Pro Val Trp Arg
260     265     270
His Arg Arg Thr Asp Leu Tyr Gly Lys Ile Ser Phe Asn Lys Pro Asp
275     280     285

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<210> 4
<211> 307
<212> PRT
<213> S. cerevisiae

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20      25      30
Ala Ile Gln Lys Lys Ala Asp Val Val Phe Leu Pro Glu Ala Ser Asp
35      40      45
Tyr Leu Ser Gln Asn Pro Leu His Ser Arg Tyr Leu Ala Gln Lys Ser
50      55      60

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Pro Lys Phe Ile Arg Gln Leu Gln Ser Ser Ile Thr Asp Leu Val Arg
 65 70 80
 Asp Asn Ser Arg Asn Ile Asp Val Ser Ile Gly Val His Leu Pro Pro
 85 90 95
 Ser Glu Gln Asp Leu Leu Glu Gly Asn Asp Arg Val Arg Asn Val Leu
 100 105 110
 Leu Tyr Ile Asp His Glu Gly Lys Ile Leu Gln Glu Tyr Gln Lys Leu
 115 120 125
 His Leu Phe Asp Val Asp Val Pro Asn Gly Pro Ile Leu Lys Glu Ser
 130 135 140
 Lys Ser Val Gln Pro Gly Lys Ala Ile Pro Asp Ile Ile Glu Ser Pro
 145 150 155 160
 Leu Gly Lys Leu Gly Ser Ala Ile Cys Tyr Asp Ile Arg Phe Pro Glu
 165 170 175
 Phe Ser Leu Lys Leu Arg Ser Met Gly Ala Glu Ile Leu Cys Phe Pro
 180 185 190
 Ser Ala Phe Thr Ile Lys Thr Gly Glu Ala His Trp Glu Leu Leu Gly
 195 200 205
 Arg Ala Arg Ala Val Asp Thr Gln Cys Tyr Val Leu Met Pro Gly Gln
 210 215 220
 Val Gly Met His Asp Leu Ser Asp Pro Glu Trp Glu Lys Gln Ser His
 225 230 235 240
 Met Ser Ala Leu Glu Lys Ser Ser Arg Arg Glu Ser Trp Gly His Ser
 245 250 255
 Met Val Ile Asp Pro Trp Gly Lys Ile Ile Ala His Ala Asp Pro Ser
 260 265 270
 Thr Val Gly Pro Gln Leu Ile Leu Ala Asp Leu Asp Arg Glu Leu Leu
 275 280 285
 Gln Glu Ile Arg Asn Lys Met Pro Leu Trp Asn Gln Arg Arg Asp Asp
 290 295 300
 Leu Phe His
 305

<210> 5

<211> 291

<212> PRT

<213> S. cerevisiae

<400> 5

Met Ser Ala Ser Lys Ile Leu Ser Gln Lys Ile Lys Val Ala Leu Val
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 Gln Leu Ser Gly Ser Ser Pro Asp Lys Met Ala Asn Leu Gln Arg Ala
 20 25 30
 Ala Thr Phe Ile Glu Arg Ala Met Lys Glu Gln Pro Asp Thr Lys Leu
 35 40 45
 Val Val Leu Pro Glu Cys Phe Asn Ser Pro Tyr Ser Thr Asp Gln Phe
 50 55 60
 Arg Lys Tyr Ser Glu Val Ile Asn Pro Lys Glu Pro Ser Thr Ser Val
 65 70 75 80
 Gln Phe Leu Ser Asn Leu Ala Asn Lys Phe Lys Ile Ile Leu Val Gly
 85 90 95
 Gly Thr Ile Pro Glu Leu Asp Pro Lys Thr Asp Lys Ile Tyr Asn Thr
 100 105 110
 Ser Ile Ile Phe Asn Glu Asp Gly Lys Leu Ile Asp Lys His Arg Lys
 115 120 125

Val His Leu Phe Asp Val Asp Ile Pro Asn Gly Ile Ser Phe His Glu
 130 135 140
 Ser Glu Thr Leu Ser Pro Gly Glu Lys Ser Thr Thr Ile Asp Thr Lys
 145 150 155 160
 Tyr Gly Lys Phe Gly Val Gly Ile Cys Tyr Asp Met Arg Phe Pro Glu
 165 170 175
 Leu Ala Met Leu Ser Ala Arg Lys Gly Ala Phe Ala Met Ile Tyr Pro
 180 185 190
 Ser Ala Phe Asn Thr Val Thr Gly Pro Leu His Trp His Leu Leu Ala
 195 200 205
 Arg Ser Arg Ala Val Asp Asn Gln Val Tyr Val Met Leu Cys Ser Pro
 210 215 220
 Ala Arg Asn Leu Gln Ser Ser Tyr His Ala Tyr Gly His Ser Ile Val
 225 230 235 240
 Val Asp Pro Arg Gly Lys Ile Val Ala Glu Ala Gly Glu Gly Glu Glu
 245 250 255
 Ile Ile Tyr Ala Glu Leu Asp Pro Glu Val Ile Glu Ser Phe Arg Gln
 260 265 270
 Ala Val Pro Leu Thr Lys Gln Arg Arg Phe Asp Val Tyr Ser Asp Val
 275 280 285
 Asn Ala His
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<210> 6
 <211> 276
 <212> PRT
 <213> S. pombe

<400> 6
 Met Thr Leu Ala Ala Val Ala Gln Leu Asn Ser Ser Gly Ser Ile Leu
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 Lys Asn Leu Ala Ile Cys Lys Glu Leu Ile Ser Gln Ala Ala Lys
 20 25 30
 Gly Ala Lys Cys Ile Phe Phe Pro Glu Ala Ser Asp Phe Ile Ala His
 35 40 45
 Asn Ser Asp Glu Ala Ile Glu Leu Thr Asn His Pro Asp Cys Ser Lys
 50 55 60
 Phe Ile Arg Asp Val Arg Glu Ser Ala Thr Lys His Ser Ile Phe Val
 65 70 75 80
 Asn Ile Cys Val His Glu Pro Ser Lys Val Lys Asn Lys Leu Leu Asn
 85 90 95
 Ser Ser Leu Phe Ile Glu Pro Leu His Gly Glu Ile Ile Ser Arg Tyr
 100 105 110
 Ser Lys Ala His Leu Phe Asp Val Glu Ile Lys Asn Gly Pro Thr Leu
 115 120 125
 Lys Glu Ser Asn Thr Thr Leu Arg Gly Glu Ala Ile Leu Pro Pro Cys
 130 135 140
 Lys Thr Pro Leu Gly Lys Val Gly Ser Ala Ile Cys Phe Asp Ile Arg
 145 150 155 160
 Phe Pro Glu Gln Ala Ile Lys Leu Arg Asn Met Gly Ala His Ile Ile
 165 170 175
 Thr Tyr Pro Ser Ala Phe Thr Glu Lys Thr Gly Ala Ala His Trp Glu
 180 185 190
 Val Leu Leu Arg Ala Arg Ala Leu Asp Ser Gln Cys Tyr Val Ile Ala
 195 200 205

Pro Ala Gln Gly Gly Lys His Asn Glu Lys Arg Ala Ser Tyr Gly His
 210 215 220
 Ser Met Ile Val Asp Pro Trp Gly Thr Val Ile Ala Gln Tyr Ser Asp
 225 230 240
 Ile Ser Ser Pro Asn Gly Leu Ile Phe Ala Asp Leu Asp Leu Asn Leu
 245 250 255
 Val Asp His Val Arg Thr Tyr Ile Pro Leu Leu Arg Arg Asn Asp Leu
 260 265 270
 Tyr Pro Thr Ile
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<210> 7
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 <212> PRT
 <213> S. pombe

<400> 7
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 Phe Pro Ser Leu Asn Phe Cys Tyr Thr Arg Asn Ile Met Ser Val Ser
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 Ala Ser Ser Leu Val Pro Lys Asp Phe Arg Ala Phe Arg Ile Gly Leu
 35 40 45
 Val Gln Leu Ala Asn Thr Lys Asp Lys Ser Glu Asn Leu Gln Leu Ala
 50 55 60
 Arg Leu Lys Val Leu Glu Ala Ala Lys Asn Gly Ser Asn Val Ile Val
 65 70 75 80
 Leu Pro Glu Ile Phe Asn Ser Pro Tyr Gly Thr Gly Tyr Phe Asn Gln
 85 90 95
 Tyr Ala Glu Pro Ile Glu Glu Ser Ser Pro Ser Tyr Gln Ala Leu Ser
 100 105 110
 Ser Met Ala Lys Asp Thr Lys Thr Tyr Leu Phe Gly Gly Ser Ile Pro
 115 120 125
 Glu Arg Lys Asp Gly Lys Leu Tyr Asn Thr Ala Met Val Phe Asp Pro
 130 135 140
 Ser Gly Lys Leu Ile Ala Val His Arg Lys Ile His Leu Phe Asp Ile
 145 150 155 160
 Asp Ile Pro Gly Gly Val Ser Phe Arg Glu Ser Asp Ser Leu Ser Pro
 165 170 175
 Gly Asp Ala Met Thr Met Val Asp Thr Glu Tyr Gly Lys Phe Gly Leu
 180 185 190
 Gly Ile Cys Tyr Asp Ile Arg Phe Pro Glu Leu Ala Met Ile Ala Ala
 195 200 205
 Arg Asn Gly Cys Ser Val Met Ile Tyr Pro Gly Ala Phe Asn Leu Ser
 210 215 220
 Thr Gly Pro Leu His Trp Glu Leu Leu Ala Arg Ala Arg Ala Val Asp
 225 230 235 240
 Asn Glu Met Phe Val Ala Cys Cys Ala Pro Ala Arg Asp Met Asn Ala
 245 250 255
 Asp Tyr His Ser Trp Gly His Ser Thr Val Val Asp Pro Phe Gly Lys
 260 265 270
 Val Ile Ala Thr Thr Asp Glu Lys Pro Ser Ile Val Tyr Ala Asp Ile
 275 280 285
 Asp Pro Ser Val Met Ser Thr Ala Arg Asn Ser Val Pro Ile Tyr Thr
 290 295 300

Gln Arg Arg Phe Asp Val Tyr Ser Glu Val Leu Pro Ala Leu Lys Lys
 305 310 315 320
 Glu Glu

<210> 8
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 <212> DNA
 <213> Homo sapien

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 caaggagccga aatatgtttc ttgtccggaa tgcctttaat ctccatctgg agcgaaatat 180
 ttctcctgaat atgcagagaa aattcctgggt gaatccacac agaagctttc tgaagttagca 240
 aaggaatgca gcataatctt catlggaggc tctatccctg aagaggatgc tgggaaatata 300
 tataacacct gtgctgtgtt tgggcctgat ggaactttac tagcaaatga tagaaagatc 360
 catctgtttg acattgatgt tcttggaaaa attacatttc aagaatctaa aacattgagt 420
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 gactcctatg ttgctggggg acacagcacc ttggtgaacc ctggggggga ggttctagcc 720
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 aaactaggtt cctctattgag atgagaaaagc ctctattatg tgacattttc caccgcacat 1020
 taaatagtta aaaaggatgc agcctggagc cagagagcga aaagctgggc tggttctgaa 1080
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 ggagttgttaa tctccatcat ctaggaaaac gtgggtctgg gtgctattct ttcccaagca 1260
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 <212> DNA
 <213> mouse

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 agcctatgtc gggaggcagc aaagcaaggt gccaacatag ttctctgccc tggagtcttc 180
 aattctccat atggaacaac ctactttcct gactatgcag agaagatccc tggagagtc 240
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ttattaaaaa	ttgttttcat	acaataaaaa	aa			1292

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 <212> DNA
 <213> X. laevis

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 <212> PRT
 <213> A. thaliana

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				20					25					30					
Ser	Thr	Val	Tyr	Asn	Asp	Thr	Pro	Ala	Thr	Ile	Asp	Lys	Ala	Glu	Lys				
				35					40				45						
Tyr	Ile	Val	Glu	Ala	Ala	Ser	Lys	Gly	Ala	Glu	Leu	Val	Leu	Phe	Pro				
				50					55				60						
Glu	Gly	Phe	Ile	Gly	Gly	Tyr	Pro	Arg	Gly	Phe	Arg	Phe	Gly	Leu	Ala				
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Val	Gly	Val	His	Asn	Glu	Glu	Gly	Arg	Asp	Glu	Phe	Arg	Lys	Tyr	His				
				85					90				95						

Ala	Ser	Ala	Ile	His	Val	Pro	Gly	Pro	Glu	Val	Ala	Arg	Leu	Ala	Asp
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Val	Ala	Arg	Lys	Asn	His	Val	Tyr	Leu	Val	Met	Gly	Ala	Ile	Glu	Lys
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Glu	Gly	Tyr	Thr	Leu	Tyr	Cys	Thr	Val	Leu	Phe	Phe	Ser	Pro	Gln	Gly
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Gln	Phe	Leu	Gly	Lys	His	Arg	Lys	Leu	Met	Pro	Thr	Ser	Leu	Glu	Arg
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Cys	Ile	Trp	Gly	Gln	Gly	Asp	Gly	Ser	Thr	Ile	Pro	Val	Tyr	Asp	Thr
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Pro	Ile	Gly	Lys	Leu	Gly	Ala	Ala	Ile	Cys	Trp	Glu	Asn	Arg	Met	Pro
		180						185					190		
Leu	Tyr	Arg	Thr	Ala	Leu	Tyr	Ala	Lys	Gly	Ile	Glu	Leu	Tyr	Cys	Ala
		195						200				205			
Pro	Thr	Ala	Asp	Gly	Ser	Lys	Glu	Trp	Gln	Ser	Ser	Met	Leu	His	Ile
		210				215					220				
Ala	Ile	Glu	Gly	Gly	Cys	Phe	Val	Leu	Ser	Ala	Cys	Gln	Phe	Cys	Gln
225				230						235				240	
Arg	Lys	His	Phe	Pro	Asp	His	Pro	Asp	Tyr	Leu	Phe	Thr	Asp	Trp	Tyr
			245					250					255		
Asp	Asp	Lys	Glu	His	Asp	Ser	Ile	Val	Ser	Gln	Gly	Gly	Ser	Val	Ile
		260					265						270		
Ile	Ser	Pro	Leu	Gly	Gln	Val	Leu	Ala	Gly	Pro	Asn	Phe	Glu	Ser	Glu
		275					280					285			
Gly	Leu	Val	Thr	Ala	Asp	Ile	Asp	Leu	Gly	Asp	Ile	Ala	Arg	Ala	Lys
		290				295					300				
Leu	Tyr	Phe	Asp	Ser	Val	Gly	His	Tyr	Ser	Arg	Pro	Asp	Val	Leu	His
305				310						315				320	
Leu	Thr	Val	Asn	Glu	His	Pro	Arg	Lys	Ser	Val	Thr	Phe	Val	Thr	Lys
			325						330					335	
Val	Glu	Lys	Ala	Glu	Asp	Asp	Ser	Asn	Lys						
		340						345							